

**TITOLO INIZIATIVA**

PROGETTO PER LA REALIZZAZIONE DI UN IMPIANTO AGRIVOLTAICO DENOMINATO "BERNARDELLO", DI POTENZA DI GENERAZIONE PARI A 26,1702 MW<sub>p</sub> E POTENZA NOMINALE PARI A 26,0748 MW, POSIZIONATO A TERRA, SITO IN C.DA PALMERI NEI COMUNI DI RAMACCA E BELPASSO (CT)

**SOCIETÀ PROPONENTE****TIMBRO E FIRMA**

CHUB 1 S.R.L  
VIA TRENTO, 17  
95030 NICOLOSI (CT)

**SOCIETÀ PROGETTAZIONE****TIMBRO E FIRMA TECNICO ABILITATO****E-PRIMA**

E-PRIMA S.R.L.  
Via Manganelli 20/g  
95030 Nicolosi (ct)  
tel: 095914116 - cell: 3339533392

**TITOLO DOCUMENTO**

DATASHEET MAIN EQUIPMENT

**FORMATO**

A4

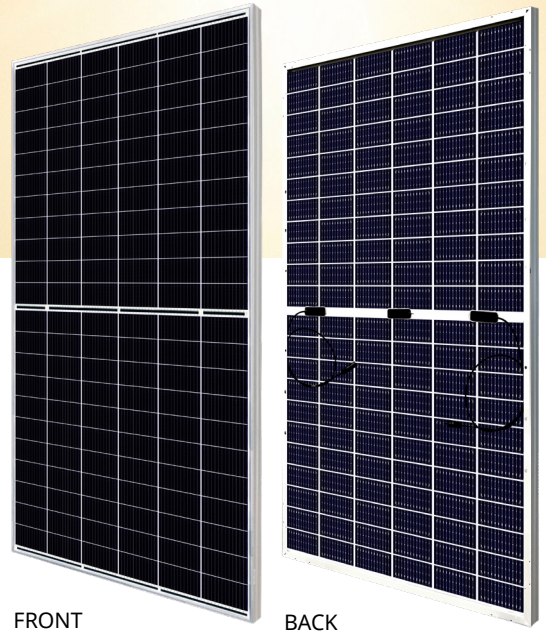
**SCALA****FOGLIO****CODICE IDENTIFICATIVO ELABORATO**

26-PD.26

**LIVELLO DI PROGETTAZIONE**

PROGETTO DEFINITIVO

00	26/10/2023	ELABORATO TECNICO	ING. G. VICINO	ING. G. VICINO	ING. G. VICINO
REVISIONE	DATA	DESCRIZIONE	PREPARATO	CONTROLLATO	VALIDATO







# BiHiKu7

**BIFACIAL MONO PERC**




**640 W ~ 670 W**

**CS7N-640 | 645 | 650 | 655 | 660 | 665 | 670MB-AG**

## MORE POWER

-  Module power up to 670 W  
Module efficiency up to 21.6 %
-  Up to 8.9 % lower LCOE  
Up to 4.6 % lower system cost
-  Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation
-  Compatible with mainstream trackers, cost effective product for utility power plant
-  Better shading tolerance

## MORE RELIABLE

-  40 °C lower hot spot temperature, greatly reduce module failure rate
-  Minimizes micro-crack impacts
-  Heavy snow load up to 5400 Pa, wind load up to 2400 Pa\*

**12 Years** Enhanced Product Warranty on Materials and Workmanship\*

**30 Years** Linear Power Performance Warranty\*

**1<sup>st</sup> year power degradation no more than 2%**  
**Subsequent annual power degradation no more than 0.45%**

\*According to the applicable Canadian Solar Limited Warranty Statement.

### MANAGEMENT SYSTEM CERTIFICATES\*

ISO 9001 : 2015 / Quality management system  
ISO 14001 : 2015 / Standards for environmental management system  
ISO 45001 : 2018 / International standards for occupational health & safety  
IEC62941 : 2019 / Photovoltaic module manufacturing quality system

### PRODUCT CERTIFICATES\*

IEC 61215 / IEC 61730 / CE / INMETRO / MCS / UKCA  
CEC listed (US California) / FSEC (US Florida)  
UL 61730 / IEC 61701 / IEC 62716 / IEC 63126 Level1 / IEC 60068-2-68  
UNI 9177 Reaction to Fire: Class 1 / Take-e-way



\* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

**CSI Solar Co., Ltd.** is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 22 years, it has successfully delivered over 100 GW of premium-quality solar modules across the world.

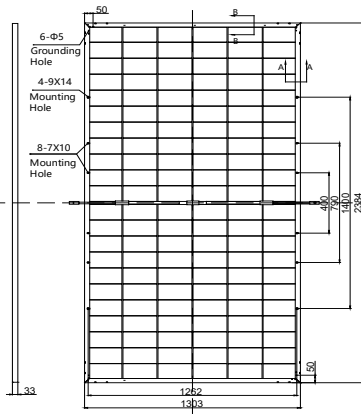
\* For detailed information, please refer to the Installation Manual.

**CSI Solar Co., Ltd.**

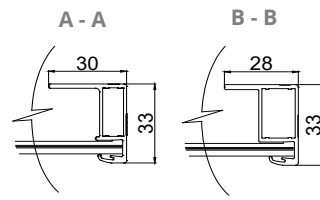
199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, [www.csisolar.com](http://www.csisolar.com), [support@csisolar.com](mailto:support@csisolar.com)

## ENGINEERING DRAWING (mm)

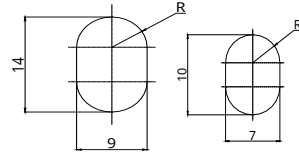
### Rear View



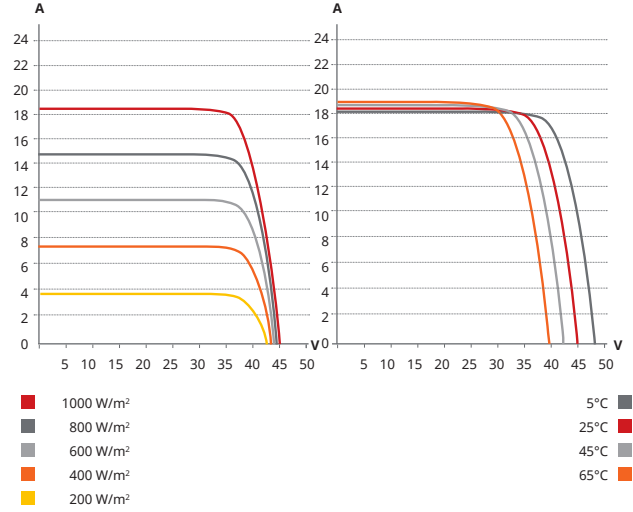
### Frame Cross Section



### Mounting Hole



## CS7N-650MB-AG / I-V CURVES



## ELECTRICAL DATA | STC\*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
<b>CS7N-640MB-AG</b>	640 W	37.5 V	17.07 A	44.6 V	18.31 A	20.6%
<b>Bifacial Gain**</b>	5%	672 W	37.5 V	17.92 A	44.6 V	21.6%
	10%	704 W	37.5 V	18.78 A	44.6 V	22.7%
	20%	768 W	37.5 V	20.48 A	44.6 V	24.7%
<b>CS7N-645MB-AG</b>	645 W	37.7 V	17.11 A	44.8 V	18.35 A	20.8%
<b>Bifacial Gain**</b>	5%	677 W	37.7 V	17.97 A	44.8 V	21.8%
	10%	710 W	37.7 V	18.84 A	44.8 V	22.9%
	20%	774 W	37.7 V	20.53 A	44.8 V	24.9%
<b>CS7N-650MB-AG</b>	650 W	37.9 V	17.16 A	45.0 V	18.39 A	20.9%
<b>Bifacial Gain**</b>	5%	683 W	37.9 V	18.03 A	45.0 V	22.0%
	10%	715 W	37.9 V	18.88 A	45.0 V	23.0%
	20%	780 W	37.9 V	20.59 A	45.0 V	25.1%
<b>CS7N-655MB-AG</b>	655 W	38.1 V	17.20 A	45.2 V	18.43 A	21.1%
<b>Bifacial Gain**</b>	5%	688 W	38.1 V	18.06 A	45.2 V	22.1%
	10%	721 W	38.1 V	18.93 A	45.2 V	23.2%
	20%	786 W	38.1 V	20.64 A	45.2 V	25.3%
<b>CS7N-660MB-AG</b>	660 W	38.3 V	17.24 A	45.4 V	18.47 A	21.2%
<b>Bifacial Gain**</b>	5%	693 W	38.3 V	18.10 A	45.4 V	22.3%
	10%	726 W	38.3 V	18.96 A	45.4 V	23.4%
	20%	792 W	38.3 V	20.69 A	45.4 V	25.5%
<b>CS7N-665MB-AG</b>	665 W	38.5 V	17.28 A	45.6 V	18.51 A	21.4%
<b>Bifacial Gain**</b>	5%	698 W	38.5 V	18.14 A	45.6 V	22.5%
	10%	732 W	38.5 V	19.02 A	45.6 V	23.6%
	20%	798 W	38.5 V	20.74 A	45.6 V	25.7%
<b>CS7N-670MB-AG</b>	670 W	38.7 V	17.32 A	45.8 V	18.55 A	21.6%
<b>Bifacial Gain**</b>	5%	704 W	38.7 V	18.20 A	45.8 V	22.7%
	10%	737 W	38.7 V	19.05 A	45.8 V	23.7%
	20%	804 W	38.7 V	20.78 A	45.8 V	25.9%

\* Under Standard Test Conditions (STC) of irradiance of 1000 W/m<sup>2</sup>, spectrum AM 1.5 and cell temperature of 25°C.

\*\* Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

## ELECTRICAL DATA

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC61730)
Max. Series Fuse Rating	35 A
Application Classification	Class A
Power Tolerance	0 ~ +10 W
Power Bifaciality*	70 %

\* Power Bifaciality =  $P_{max, rear} / P_{max, front}$ , both  $P_{max, rear}$  and  $P_{max, front}$  are tested under STC, Bifaciality Tolerance: ± 5 %

\* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

## ELECTRICAL DATA | NMOT\*

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
<b>CS7N-640MB-AG</b>	480 W	35.2 V	13.64 A	42.2 V	14.77 A
<b>CS7N-645MB-AG</b>	484 W	35.3 V	13.72 A	42.3 V	14.80 A
<b>CS7N-650MB-AG</b>	487 W	35.5 V	13.74 A	42.5 V	14.83 A
<b>CS7N-655MB-AG</b>	491 W	35.7 V	13.76 A	42.7 V	14.86 A
<b>CS7N-660MB-AG</b>	495 W	35.9 V	13.79 A	42.9 V	14.89 A
<b>CS7N-665MB-AG</b>	499 W	36.1 V	13.83 A	43.1 V	14.93 A
<b>CS7N-670MB-AG</b>	502 W	36.3 V	13.85 A	43.3 V	14.96 A

\* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m<sup>2</sup> spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

## MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	132 [2 x (11 x 6)]
Dimensions	2384 x 1303 x 33 mm (93.9 x 51.3 x 1.30 in)
Weight	37.8 kg (83.3 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm <sup>2</sup> (IEC), 10 AWG (UL)
Cable Length (Including Connector)	410 mm (16.1 in) (+) / 250 mm (9.8 in) (-) or customized length*
Connector	T6 or MC4-EVO2 or MC4-EVO2A
Per Pallet	33 pieces
Per Container (40' HQ)	594 pieces or 495 pieces (only for US & Canada)

\* For detailed information, please contact your local Canadian Solar sales and technical representatives.

## TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.34 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

## PARTNER SECTION



## CSI Solar Co., Ltd.

199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, www.csisolar.com, support@csisolar.com





# iTracker-WL: catching all the sun

iTracker WL – the intelligent tracker – maximizes the output of your PV power plant, thanks to its all-around performance and Soltigua's customer-tailored solutions



# Track and field: iTracker-WL's decathlon

"The decathlon includes ten separate events and they all matter. You can't work on just one of them."

Dan O'Brien - Olympic gold medal



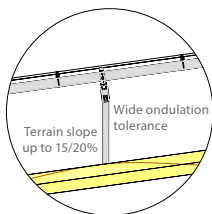
**Track** Horizontal single-axis trackers increase the performance of PV power plants by up to 30% with a limited increase of the investment. By following the sun throughout the day PV trackers maximise power generation. They also better match the grid demand profile, which peaks in the afternoon, and contribute to a smarter and more sustainable energy system.

**Field** To maximize the actual PV output in the field, trackers must deliver on several dimensions during all phases of the PV project life: design, installation, operation and maintenance. Challenges range from field configuration to need for local content, from local labour skills to weather conditions, from budgetary constraints all the way down to asset management for a long lifespan.

**iTracker's decathlon** Effective tracker performance requires all-around achievements and attention to detail, like a decathlete, who prepares for multiple challenges at the same time. This is iTracker's intelligence: delivering everywhere it matters!

## 01 Site Adaptability

### The most flexible tracker on the market



- North South slopes up to 15/20%; wide terrain undulation tolerance
- Independent row tracking enables more flexible layouts
- Alignment is possible in any direction to adapt to site constraints
- Project-optimized tracker design

## 02 Wind Management

### Holistic approach to wind loads



- Wind tunnel tested, including dynamic analysis
- Intelligent stowing position along the array avoids wind galloping
- Soltigua's patented bearing concept includes a torsional limiter
- An embedded damping factor avoids the addition of external dampers





### 03 Outdoor Resistance Ready for the harshest environment



- Patented rolling bearing outperforms the sliding one against dust
- IP 65 slew drive and IP66 tracker panel against moisture, dust and molten salt
- Broad range of working temperatures from -20°C to +50°C
- HDG metal structure and components with advanced coatings (Zn-Al-Mg)

### 04 Wireless Operation Sub GHz radio architecture for optimal results



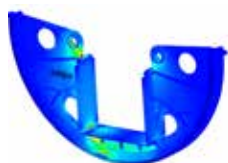
- Long range communication (250m)
- Low power consumption and long life batteries (up to 5+ days of autonomy)
- Dedicated PV module for battery charge
- Broadcast messages for rapid communication to trackers

### 05 Endurance & Reliability Designed and field tested for 50-year service



- Patented balanced design reduces mechanical stress on structure and motor
- Proprietary rugged printed control board can resist temperatures from -20° to +80°C
- Drive and bearing components tested on the field for an equivalent 50-year service
- Optional wide charging-range rugged Li-FeO4 batteries

### 06 Advanced Design Integrated mechanical engineering



- Tracking precision, balanced design and broad rotation range increase yield by up to 1,5%
- Engineering platform leverages Soltigua's experience in complex CSP collectors
- 3D CAD modelling enables rapid virtual prototyping and in depth analysis
- FEM (Finite Elements) analysis performed for various load cases on critical components



## 07 Intelligent Monitoring **Monitoring tailored to specific customer needs**



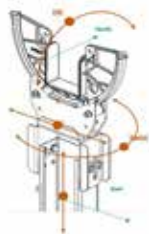
- Individual monitoring and control of each tracker
- Soltigua's cloud-based SCADA shows solar array status at a glance, in an intuitive manner
- Single tracker status can also be detected, including warnings and alerts
- Real time and historical data available

## 08 Minimized O&M **Minimized operating cost for the pv array**



- Proprietary NFC app to support fast commissioning and seamless O&M
- Maintenance position can be set tracker by tracker
- Simplified cleaning and vegetation management: no obstacles between rows
- Continuous table is already optimized for autonomous robot cleaning

## 09 Ease of installation **Fast, simple and user friendly installation**



- Highest installation tolerances on the market avoid repair work at construction site
- No specialized tool is required during installation: no welding, no drilling
- Installation manual available to partners and clients
- Installation courses in Soltigua's headquarters and on project sites
- Few bolt types to simplify installation

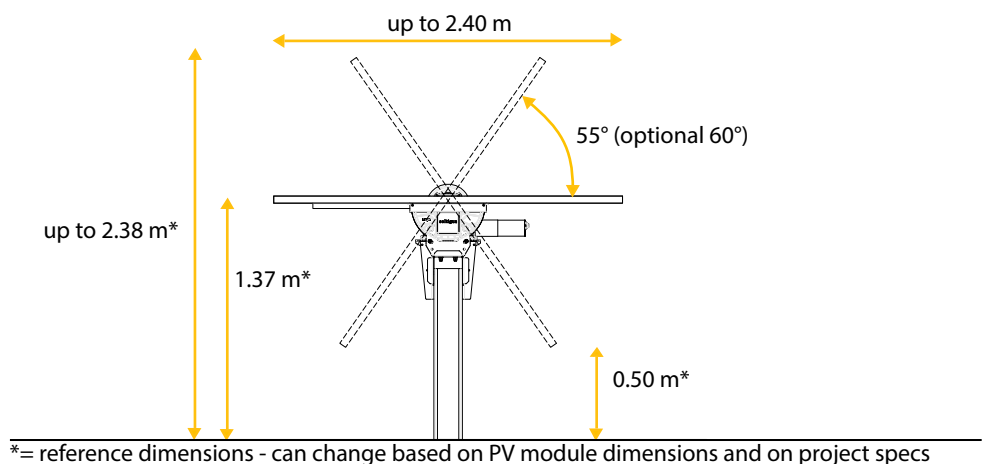
## 10 Certified Quality **100% compliant to state-of-the-art standards**



- CE marked according to the Machinery Directive 2006/42/UE
- Structural design compliant with Eurocodes EN 1991-1-1, EN 1991-1-3, EN 1991-1-4
- Electrical design as per EU Directives 2014/35/UE (LV) and 2014/30/UE (EMC)
- Certified by TUV Sud according to ISO 9001:2015 and 14001:2015
- IEC 62817:2014 certified

# Technical features

Tracking type	Independent single axis horizontal tracker; Any tracker alignment possible (ideally along North-South direction);
Tracking algorithm	Accurate astronomical formulas; tracking precision = 1.0°. Individually customized 3D backtracking to follow terrain undulations
Rotation range	Standard: $\pm 55^\circ$ ; optional $\pm 60^\circ$ also available
Ground cover ratio	Freely configurable by customer (between 34% and 50%)
PV Module compatibility	Framed modules; all major brands
Module mount	1 module portrait; 2 modules landscape
Drive system	1 Independent slew drive per tracker
Peak power per tracker	Up to 45 kWp per tracker (with 500Wp modules)
N° of Module per tracker	Up to 90 72-cell modules (1500 V)
PV array voltage	1000 V or 1500 V
Power supply	Self powered with dedicated small PV module and Li-FePO <sub>4</sub> battery
Communication	Soltigua wireless radio network or dedicated RS485 serial communication
Monitoring	Local control via SCADA; remote control available
Foundation type	Standard: driven piles; compatible also with: shallow foundation (concrete blocks); ground screws
Wind resistance (Eurocodes)	In operation: up to 80 km/h in any position; Stow position: up to 200+ km/h in stow position
Snow resistance	Up to 1'500 N/m <sup>2</sup> ; depending on tracker version
Tracker stowing time	≤ 6 min; 3.5 min on average
Installation tolerances	North South: $\pm 50$ mm; East-West: $\pm 40$ mm standard pile; $\pm 28$ mm drive pile; Height tolerance: $\pm 45$ mm; Pile tilt: $\pm 1^\circ$ ; Twist: $15^\circ$
Ground slope	Max 15% slope in longitudinal direction (North- South); optional max 20% also available Any slope in transversal direction (East-West) [max 70% local slope for rotation clearance] Local deviation from theoretical ground profile is $\pm 150$ mm
Installation method	Engineered for fast and easy assembly; no welding nor drilling required on site
Materials	HDG and ZM construction steel; maintenance free bearings; triennial maintenance for slew drive
Certifications/Compliance	CE 2006/42/UE; Eurocodes EN1991-1-1/3/4; LV 2014/35/UE; EMC 2014/30/UE ; ISO 9001-2015 and ISO 14001-2015; IEC 62817:2017
Warranty	Structure: 10 years; Drive, batteries and electronics: 5 years; Corrosion: 30 years in C2 atmospheric environment; Warranty extension available
Earthing	The rotating structure is connected to the ground through its drive pile





# Dedicated global service



## Project engineering - Tailored to the needs of each individual plant

- Choice of optimal trackers based on project features (PV modules, land, wind etc.)
- Detailed layout development already during proposal
- Optimization during basic engineering



## Scope of supply - Flexible battery limits for goods and services

- On-site presence adapted to customer preference: from simple supervision to full turn-key
- If wished, selected structural components can be sourced locally by the client



## Project management - Reliable network across 4 continents

- 100+ year of cumulative experience in project management
- Extensive network of local partners for seamless client service
- Projects successfully delivered and commissioned across 4 continents



## Post sale assistance - Guaranteed support - online and onsite

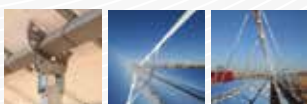
- 99% availability guarantee included as sales contract standard
- Suitable stock of spare parts supplied and maintained available on site
- Remote monitoring service available upon request



## Training - Supporting continuous learning during the entire life of the plant

- Dedicated courses at Soltigua's headquarters for construction partners
- On-site sessions during erection and commissioning phase
- Comprehensive manuals for detailed reference during O&M

## A unique product portfolio



Soltigua is the only PV tracker supplier with a 10-year experience in engineering and manufacturing concentrating collectors for solar heat up to 320°C. By manufacturing both parabolic troughs and Fresnel collectors, Soltigua can offer the most suitable solution to any solar thermal installation.

For more information and quotes write to [sales@soltigua.com](mailto:sales@soltigua.com)



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# SUN2000-215KTL-H3

## Smart String Inverter



100A  
Per MPPT



Max. Efficiency  
≥99.0%



Smart String-Level  
Disconnect



Smart I-V Curve  
Diagnosis Supported



MBUS  
Supported



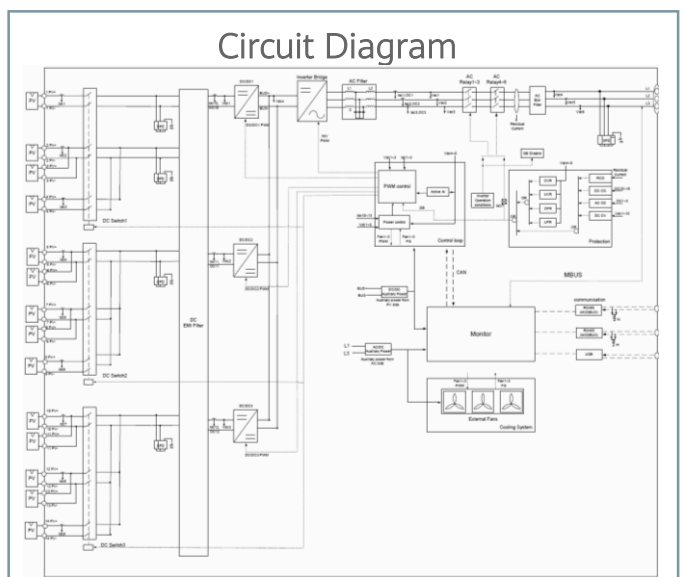
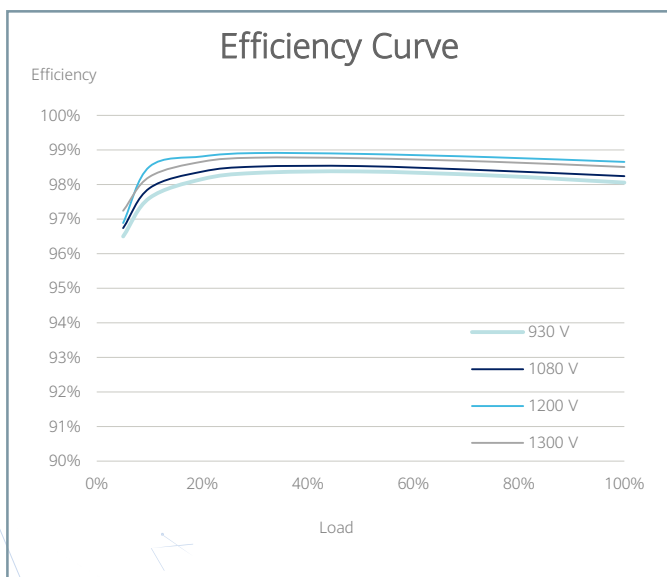
Fuse Free  
Design



Surge Arresters for  
DC & AC



IP66  
Protection



# Technical Specifications

Efficiency	
Max. Efficiency	≥99.0%
European Efficiency	≥98.8%
Input	
Max. Input Voltage	1,500 V
Number of MPP Trackers	3
Max. Current per MPPT	100A/100A/100A
Max. PV Inputs per MPPT	4/5/5
Start Voltage	550 V
MPPT Operating Voltage Range	500 V ~ 1,500 V
Nominal Input Voltage	1,080 V
Output	
Nominal AC Active Power	200,000 W
Max. AC Apparent Power	215,000 VA
Max. AC Active Power (cosφ=1)	215,000 W
Nominal Output Voltage	800 V, 3W + PE
Rated AC Grid Frequency	50 Hz / 60 Hz
Nominal Output Current	144.4 A
Max. Output Current	155.2 A
Adjustable Power Factor Range	0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion	< 1%
Protection	
Input-side Disconnection Device	Yes
Anti-islanding Protection	Yes
AC Overcurrent Protection	Yes
DC Reverse-polarity Protection	Yes
PV-array String Fault Monitoring	Yes
DC Surge Arrester	Type II
AC Surge Arrester	Type II
DC Insulation Resistance Detection	Yes
Residual Current Monitoring Unit	Yes
Communication	
Display	LED Indicators, WLAN + APP
USB	Yes
MBUS	Yes
RS485	Yes
General	
Dimensions (W x H x D)	1,035 x 700 x 365 mm (40.7 x 27.6 x 14.4 inch)
Weight (with mounting plate)	≤86 kg (191.8 lb.)
Operating Temperature Range	-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method	Smart Air Cooling
Max. Operating Altitude without Derating	4,000 m (13,123 ft.)
Relative Humidity	0 ~ 100%
DC Connector	Staubli MC4 EVO2
AC Connector	Waterproof Connector + OT/DT Terminal
Protection Degree	IP66
Topology	Transformerless



# ARE4H5E COMPACT



**Unipolare 12/20 kV e 18/30 kV**  
*Single core 12/20 kV and 18/30 kV*

**Norma di riferimento**  
**HD 620/IEC 60502-2**

**Descrizione del cavo**

**Anima**

Conduttore a corda rotonda compatta di alluminio

**Semiconduttivo interno**

Mescola estrusa

**Isolante**

Mescola di polietilene reticolato (qualità DIX 8)

**Semiconduttivo esterno**

Mescola estrusa

**Rivestimento protettivo**

Nastro semiconduttore igroespandente

**Schermatura**

Nastro di alluminio avvolto a cilindro longitudinale (Rmax 3Ω/Km)

**Guaina**

Polietilene: colore rosso (qualità DMP 2)

**Marcatura**

**PRYSMIAN (\*\*)** ARE4H5E <tensione>  
 <sezione> <anno>

(\*\*) sigla sito produttivo

Marcatura in rilievo ogni metro  
 Marcatura metrica ad inchiostro

**Applicazioni**

Il cavo rispetta le prescrizioni della norma HD 620 per quanto riguarda l'isolante; per tutte le altre caratteristiche rispetta le prescrizioni della IEC 60502-2.

**Accessori idonei**

**Terminali**

ELTI-1C (pag. 115), ELTO-1C (pag. 118), FMCS 250 (pag. 128), FMCE (pag. 130), FMCTS-400 (pag. 132), FMCTXs-630/C (pag. 136)

**Giunti**

ECOSPEED™ (pag. 140)

**Standard**  
**HD 620/IEC 60502-2**

**Cable design**

**Core**

Compact stranded aluminium conductor

**Inner semi-conducting layer**

Extruded compound

**Insulation**

Cross-linked polyethylene compound (type DIX 8)

**Outer semi-conducting layer**

Extruded compound

**Protective layer**

Semiconductive watertight tape

**Screen**

Aluminium tape longitudinally applied (Rmax 3Ω/Km)

**Sheath**

Polyethylene: red colour (DMP 2 type)

**Marking**

**PRYSMIAN (\*\*)** ARE4H5E <rated voltage>  
 <cross-section> <year>

(\*\*) production site label

Embossed marking each meter  
 Ink-jet meter marking

**Applications**

According to the HD 620 standard for insulation, and the IEC 60502-2 for the other characteristics.

**Suitable accessories**

**Terminations**

ELTI-1C (pag. 115), ELTO-1C (pag. 118), FMCS 250 (pag. 128), FMCE (pag. 130), FMCTS-400 (pag. 132), FMCTXs-630/C (pag. 136)

**Joints**

ECOSPEED™ (pag. 140)

TEMPERATURA FUNZIONAMENTO / OPERATING TEMPERATURE	TEMPERATURA CORTOCIRCUITO / SHORT-CIRCUIT TEMPERATURE	RIGIDO / RIGID

**Condizioni di posa / Laying conditions**

TEMPERATURA MIN. DI POSA -25 °C / MINIMUM INSTALLATION TEMPERATURE -25 °C	CANALE INTERRATO / BURIED TROUGH	TUBO INTERRATO / BURIED DUCT	ARIA LIBERA / OPEN AIR	INTERRATO CON PROTEZIONE / BURIED WITH PROTECTION

## ARE4H5E COMPACT

Unipolare 12/20 kV e 18/30 kV  
Single core 12/20 kV and 18/30 kV

### Conduttore di alluminio / Aluminium conductor - ARE4H5E

sezione nominale	diametro conduttore	diametro sull'isolante	diametro esterno nominale	massa indicativa del cavo	raggio minimo di curvatura
<i>conductor cross-section</i>	<i>conductor diameter</i>	<i>diameter over insulation</i>	<i>nominal outer diameter</i>	<i>approximate weight</i>	<i>minimum bending radius</i>
(mm <sup>2</sup> )	(mm)	(mm)	(mm)	(kg/km)	(mm)

sezione nominale	portata di corrente in aria	posa interrata a trifoglio p=1 °C m/W	posa interrata a trifoglio p=2 °C m/W
<i>conductor cross-section</i>	<i>open air installation</i>	<i>underground installation trefoil</i>	
(mm <sup>2</sup> )	(A)	(A)	(A)

#### Dati costruttivi / Construction charact. - 12/20 kV

50	8,2	19,9	28	580	370
70	9,7	20,8	29	650	380
95	11,4	22,1	30	740	400
120	12,9	23,2	32	840	420
150	14,0	24,3	33	930	440
185	15,8	26,1	35	1090	470
240	18,2	28,5	37	1310	490
300	20,8	31,7	42	1560	550
400	23,8	34,9	45	1930	610
500	26,7	37,8	48	2320	650
630	30,5	42,4	53	2880	700

#### Caratt. elettriche / Electrical charact. - 12/20 kV

50	186	175	134
70	230	214	164
95	280	256	197
120	323	291	223
150	365	325	250
185	421	368	283
240	500	427	328
300	578	483	371
400	676	551	423
500	787	627	482
630	916	712	547

#### Dati costruttivi / Construction charact. - 18/30 kV

50	8,2	25,5	34	830	450
70	9,7	25,6	34	870	450
95	11,4	26,5	35	950	470
120	12,9	27,4	36	1040	470
150	14,0	28,1	37	1130	490
185	15,8	29,5	38	1260	510
240	18,2	31,5	41	1480	550
300	20,8	34,7	44	1740	590
400	23,8	37,9	48	2130	650
500	26,7	41,0	51	2550	690
630	30,5	45,6	56	3130	760

#### Caratt. elettriche / Electrical charact. - 18/30 kV

50	190	175	134
70	235	213	164
95	285	255	196
120	328	291	223
150	370	324	249
185	425	368	283
240	503	426	327
300	581	480	369
400	680	549	422
500	789	624	479
630	918	709	545

# ARE4R 0,6/1 kV



## Norma di riferimento IEC 60502-1

### Descrizione del cavo

#### Anima

Conduttore a corda compatta a fili di alluminio in accordo alla norma IEC 60228, classe 2

#### Isolante

Mescola di polietilene reticolato

#### Colori delle anime

● nero

#### Guaina

In PVC speciale di qualità ST2, colore nero

#### Marcatura

Stampigliatura ad inchiostro speciale ogni 1 m:  
**PRYSMIAN (\*) ARE4R 0,6/1 KV 1X50 MM2 <anno>**

(\*) sigla sito produttivo

## Conforme ai requisiti essenziali delle direttive BT 2006/95/CE

### Applicazioni

Adatti per alimentazione e trasporto di energia nell'industria/artigianato e dell'edilizia residenziale.

Adatti per posa fissa sia all'interno, che all'esterno su passerelle, in tubazioni, canalette o sistemi similari. Possono essere direttamente interrati.

## Standard IEC 60502-1

### Cable design

#### Core

Aluminium rigid compact conductor, class 2, IEC 60228

#### Insulation

Cross-linked polyethylene compound

#### Core identification

● black

#### Sheath

Special PVC black outer sheath, ST2 type

#### Marking

Special ink marking each meter:

**PRYSMIAN (\*) ARE4R 0,6/1 KV 1X50 MM2 <year>**

(\*) production site label

## Compliant with the requirements of the BT 2006/95/CE directives

### Applications

For supply and feeding of power in industry, public applications and residential buildings. Suitable for fixed installation both indoor and outdoor, on cable trays, in pipe, conduits or similar systems.

Can be directly buried.

TEMPERATURA  
FUNZIONAMENTO /  
OPERATING  
TEMPERATURE



TEMPERATURA  
CORTOCIRCUITO /  
SHORT-CIRCUIT  
TEMPERATURE



CEI 20-35  
EN 60332



RIGIDO /  
RIGID



## Condizioni di posa / Laying conditions

TEMPERATURA  
MIN. DI POSA 0 °C /  
MINIMUM  
INSTALLATION  
TEMPERATURE 0 °C



TUBO  
O CANALINA  
IN ARIA /  
DUCT OR  
CABLE TRAY



CANALE  
INTERRATO /  
BURIED TROUGH



TUBO  
INTERRATO /  
BURIED DUCT



ARIA LIBERA /  
OPEN AIR



INTERRATO CON  
PROTEZIONE /  
BURIED  
WITH PROTECTION





## ARE4R 0,6/1 kV



## ARE4R

sezione nominale	diametro conduttore	spessore nominale isolante	diametro esterno nominale	peso indicativo del cavo	resistenza massima a 20 °C in c. c.	portata di corrente (A) con temperatura ambiente di		raggio minimo di curvatura
<i>conductor cross-section</i>	<i>conductor diameter</i>	<i>nominal insulation thickness</i>	<i>nominal outer diameter</i>	<i>approximate weight</i>	<i>maximum DC resistance at 20 °C</i>	30 °C in aria	20 °C interrato	<i>minimum bending radius</i>
(mm <sup>2</sup> )	(mm)	(mm)	(mm)	(kg/km)	(Ω/km)	permissible current rating (A) in open air at 30 °C buried at 20 °C		(mm)

## 1 conduttore / Single core

16	4,75	0,7	9,5	110	1,91	78	98	114
25	6,0	0,9	11,0	160	1,20	106	126	132
35	7,0	0,9	12,0	190	0,868	130	151	144
50	8,2	1,0	13,5	240	0,641	158	178	162
70	9,7	1,1	15,0	310	0,443	203	218	180
95	11,4	1,1	17,0	410	0,320	250	261	204
120	12,9	1,2	19,0	500	0,253	294	296	228
150	14,0	1,4	20,5	600	0,206	339	332	246
185	15,8	1,6	22,5	730	0,164	392	374	270
240	18,2	1,7	25,0	930	0,125	470	432	300
300	20,8	1,8	28,0	1150	0,100	544	486	336
400	23,8	2,0	32,0	1470	0,0778	633	549	384
500	26,7	2,2	36,0	1850	0,0605	737	619	432
630	30,5	2,4	40,0	2350	0,0469	853	693	480

**Note / Notes:**

Le portate dei cavi unipolari sono state calcolate per tre cavi a trifoglio.

Le portate dei cavi interrati sono state calcolate considerando una profondità di posa di 0,8 m.

*Current carrying capacities for single core cables are calculated assuming three cables laying in trefoil formation.*

*Current carrying capacities for buried cables are calculated assuming a laying depth of 0,8 m.*



# Photovoltaic Solar H1Z2Z2-K Cable



Eland Product Group: E6S

## APPLICATION

Updated harmonised (H1Z2Z2-K) European standard solar cable intended for the interconnection within photovoltaic systems such as solar panel arrays. Suitable for fixed installations, internal and external, within conduit or systems. Impact tested - Suitable for direct burial. For installations where fire, smoke emissions and toxic fumes create a potential risk to life and equipment. Water resistant to AD8.

## CHARACTERISTICS

### Voltage Rating U<sub>o</sub>/U

AC: 1000/1000V  
DC: 1500/1500V

### Maximum Voltage (U<sub>max</sub>)

1800V

### Test Voltage

6.5kV AC

### Temperature Rating

Fixed: -40°C to +90°C

### Minimum Bending Radius

5 x overall diameter

### Maximum Conductor Temperature

+120°C (for 20000h)

## CONSTRUCTION

### Conductor

Class 5 flexible tinned copper conductor

### Insulation

Halogen-free cross-linked compound

### Sheath

Halogen-free cross-linked, flame retardant compound

### Sheath Colour

● Black  
Other colours available on request

## STANDARDS

EN 50618, TÜV 2 PFG 1169/08.2007, EN 50288-3-7,  
EN 60068-2-78, EN 50395

Flame retardant to IEC/EN 60332-1-2

Low Smoke Zero Halogen to IEC/EN 60754-1/2,  
IEC/EN 61034-1/2, EN 50267-2-2

Ozone and UV Resistant to EN 60811-403, EN 50396,  
EN ISO 4892-1/3,

Water Resistant to AD8

## THE CABLE LAB®

AN ISO/IEC 17025 AND IEC/IECEE CBTL ACCREDITED FACILITY

Our world-class testing facility assures the quality and compliance of this cable through a continuous and rigorous testing regime.



## SUSTAINABILITY COMMITMENT

We are on a journey to Net Zero.

We've committed to near-term emissions reductions and a net-zero target with the Science Based Targets initiative and we're a signatory to the United Nations Global Compact Sustainable Development Goals.

Learn more about embodied carbon and our carbon emissions reduction actions, our comprehensive recycling services, and wider ESG activities for sustainable operations at: [www.elandcables.com/company/about-us/esg-sustainability](http://www.elandcables.com/company/about-us/esg-sustainability)



## REGULATORY COMPLIANCE

This cable is compliant with European Regulation EN 50575, the Construction Products Regulation.



This cable meets the requirements of the Low Voltage Directive 2014/35/EU and the RoHS Directive 2011/65/EU. RoHS compliance has been tested and confirmed by The Cable Lab® as meeting the requirements of the BSI RoHS Trusted Kitemark™.





## DIMENSIONS

ELAND PART NO.	NO. OF CORES	NOMINAL CROSS SECTIONAL AREA mm <sup>2</sup>	NOMINAL OVERALL DIAMETER mm	NOMINAL WEIGHT kg/km	TENSILE STRENGTH IN OPERATION N
E6S10015BK000	1	1.5	4.6	36	22
E6S10025BK000	1	2.5	5.0	46	37
E6S10040BK000	1	4	5.6	62	60
E6S10060BK000	1	6	6.1	82	90
E6S10100BK000	1	10	7.1	125	150
E6S10160BK000	1	16	8.5	190	240
E6S10250BK000	1	25	10.4	285	375
E6S10350BK000	1	35	11.5	385	525
E6S10500BK000	1	50	13.7	540	750
E6S10700BK000	1	70	15.8	740	1050
E6S10950BK000	1	95	17.3	965	1350
E6S11200BK000	1	120	19.1	1210	1800
E6S11500BK000	1	150	21.4	1495	2250
E6S11850BK000	1	185	24.9	1885	2775
E6S12400BK000	1	240	27.3	2395	3600

## ELECTRICAL CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm <sup>2</sup>	MAXIMUM DC RESISTANCE OF CONDUCTOR AT 20°C ohms/km	MAXIMUM DC RESISTANCE OF CONDUCTOR AT 90°C ohms/km	CURRENT CARRYING CAPACITY Amps		
			Single Cable In Air	Single Cable On Surface	Two Cables Adjacent On Surface
1.5	13.70	17.468	30	29	24
2.5	8.21	10.468	41	39	33
4	5.09	6.490	55	52	44
6	3.39	4.322	70	67	57
10	1.95	2.486	98	93	79
16	1.24	1.581	132	125	107
25	0.795	1.013	176	167	142
35	0.565	0.720	218	207	176
50	0.393	0.501	276	262	221
70	0.277	0.353	347	330	278
95	0.21	0.267	416	395	333
120	0.164	0.209	488	464	390
150	0.132	0.168	566	538	453
185	0.108	0.137	644	612	515
240	0.0817	0.104	775	736	620

## DE-RATING FACTORS

AIR TEMPERATURE	UP TO 60°C	70°C	80°C	90°C	100°C	110°C
DE-RATING FACTOR	1.00	0.91	0.82	0.71	0.58	0.41

The information contained within this datasheet is for guidance only and is subject to change without notice or liability. All the information is provided in good faith and is believed to be correct at the time of publication. When selecting cable accessories, please note that actual cable dimensions may vary due to manufacturing tolerances.